

THE HABITS AND RELATIONSHIPS OF THE MAGELLANIC WOODPECKER

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THE Andes Mountains from central eastern Chile and central western Argentina south to Tierra del Fuego are cloaked with a south temperate forest dominated by various species of southern beech (genus *Nothofagus*) trees. Such forests are the home of a unique avifauna (Vuilleumier, 1967), including three species of woodpeckers. Only two of the latter actually gain their sustenance in true woodpecker fashion within the confines of the forest. The third species, the Chilean Flicker (*Colaptes pitius*), forages mainly on the ground about the edges of the forest, and around small isolated patches of forest in open country. The two forest woodpeckers are the small Striped Woodpecker (*Dendrocopos lignarius*) and the large Magellanic Woodpecker (*Campephilus magellanicus*). The latter was the subject of brief studies during late November 1967 in the region north of San Martín de los Andes, Neuquén, and at the Río Villegas, 54 km south of San Carlos de Bariloche, Río Negro. My particular interest in this species stemmed from its supposed close relationship (e.g., Peters, 1948) with the North American ivory-billed woodpeckers (*Campephilus principalis* and *C. imperialis*). Vocalizations were recorded on tape, and movies were obtained, mainly of one nesting pair of birds at Río Villegas on 28–29 November.

ECOLOGY AND HABITS

The general appearance of this large woodpecker is shown in Figures 1 to 3 (see also Fig. 7); a description is presented below. Magellanic Woodpeckers occurred mainly in mature, little disturbed southern beech forest and mixed southern beech-cypress (*Cupressus*) forest. They were observed less commonly in cutover forest such as that shown in Figure 4. They were common at one and abundant at the other of the two localities where they were studied and they far outnumbered the uncommon *Dendrocopos lignarius*. Northeast of Lake Lolog, 18 km north of San Martín de los Andes, we located at least 13 pairs of these birds within a forest-edge strip about 100 m wide by about 2 km long (Figs. 5, 6).

The sounds of their workings were not very loud; indeed, I could not distinguish with certainty the sounds made by feeding Magellanic Woodpeckers from those of feeding Striped Woodpeckers. The Magellanic Woodpeckers foraged in all parts of the trees. I saw them cling *Dendrocopos*-like to tiny twigs which seemed too small to support them and they fed as well on the main trunks of large (to 1½ m in diameter at breast height) trees. Two birds



FIG. 1. Male Magellanic Woodpecker at nest cavity 54 kilometers south of San Carlos de Bariloche, Río Negro, near the Río Villegas. (Figs. 1-3 from 16-mm color movies.)



FIG. 2. Female Magellanic Woodpecker at nest cavity; mate of male depicted in Figure 1.



FIG. 3. Same female Magellanic Woodpecker as in Figure 2, shown in silhouette with crest in typical position.

foraged on fallen, rotting logs, and one of these briefly descended to the ground while inspecting the fallen log. It struck me that this species seemed to occupy a broad "woodpecker niche," perhaps correlated with the virtual absence of competition. In its diversity of foraging sites it resembled species of *Dryocopus* (e.g., *pileatus*, *lineatus*) more than other campephiline species.

The dimorphism in bill length between sexes of this species (Table 1) is in accord with the possibly broadened "niche" of *Campephilus magellanicus* in the absence of close competitors. Such sexual dimorphism was discussed by Selander and Giller (1963), who stressed its occurrence on islands inhabited by few or one species of woodpecker. It seems obvious that dimorphism in bill size, presumably correlated with differences in feeding habits between males and females (see, e.g., Kilham, 1965; Selander, 1965, 1966; Ashmole, 1967; and Ligon, 1968), can be expected wherever a species of woodpecker exists in the absence of other woodpeckers. In effect the depauperate Fuegian *Nothofagus* forests are an "insular" situation for the Magellanic Woodpecker, as only the terrestrially feeding *Colaptes pitius* and the diminutive *Dendrocopos lignarius* occur sympatrically. Unfortunately, I have too few observations of feeding Magellanic Woodpeckers to demonstrate a difference in feeding habits between males and females. However, it is

TABLE I
SEXUAL OVERLAP IN MILLIMETERS OF THE EXPOSED CULMEN OF
THREE WOODPECKERS (*CAMPEPHILUS*).

Species	♀ range	♂ range	Sexual overlap in range	Per cent range overlap	Per cent joint non- overlap*	N
<i>C. magellanicus</i>	43.5-54.5	51.8-58.5	2.7	18	90	28
<i>C. principalis</i>	60.5-67.5	63.0-72.9	4.5	36	76	54
<i>C. imperialis</i>	72.5-84.7	78.5-85.5	6.2	48	70	34

* Determined from Coefficient of Difference (Mayr, Linsley and Usinger, 1953:146) obtained for both culmen length and bill length from nostril. C. D. values were below 0.70 in both measurements for the two larger species and were 1.29 (culmen) and 1.40 (bill length from nostril) for *C. magellanicus*. The differences exhibited are thought to be the minimal that can obtain, because adults from all areas and all times of the year were utilized. On a local basis, allowing for possible temporal variation, the differences undoubtedly would be greater.

noteworthy that the several individuals that were observed feeding at the tips of small branchlets were females.

Magellanic Woodpeckers foraging on larger limbs and trunks move easily upward with the tail appressed to the surface of the tree and the legs spread outward. The head is often held quite far out from the surface of the tree (Fig. 3). Examination of movies I have taken clearly shows that all the toes of this woodpecker are normally directed forward and laterally, often well spread apart; the position of the toes varied within these limits from that illustrated in Figure 6 A to that in Figure 6 B by Bock and Miller (1959: 22).

The action of the bill in feeding varies from light taps and probes to heavy blows. I never witnessed a sustained flurry of pecking; rather, pecking was deliberate, only one or few pecks being delivered at a time. A female feeding chickadee-like in the outermost branches of a *Nothofagus* tree, used her bill entirely for probing during 10 minutes of observation. Nevertheless, the bill can be used to deliver powerful blows, and I was surprised at the ease with which one or two strong blows of a male cut a piece of bark from a live tree. Workings of these woodpeckers included areas on trees with several small to large (10 cm) pieces of bark removed, and deeply chiseled holes like those of a Pilcated Woodpecker (*Dryocopus pileatus*).

Foraging took place in both dead and live trees (species of *Nothofagus* and *Cupressus*), and in live and dead branches of living trees. Most trees had dead limbs or even fully dead tops; when viewed from a distance the mountain forest at 18 km northeast of San Martín de los Andes, where Magellanic Woodpeckers were abundant, appeared a peculiar gray-green color due to the dead gray tops of many of the trees (Fig. 5). Some feeding takes place on fallen logs, as mentioned above. The birds progress rather



FIG. 4. Cutover *Nothofagus* forest (lower slopes) and mature forest (upper slopes) above Lake Meliquina, about 25 kilometers south of San Martín de los Andes, Neuquén. Magellanic Woodpeckers occupy mature forest, and, sporadically, patches of cutover forest.

rapidly while feeding, moving often from tree to tree. The wings of these woodpeckers produce a flapping sound as the birds fly from tree to tree. The white in their wings (pattern described below) is also very obvious while they are in flight.

Nesting (and, presumably, roosting) cavities are excavated in partly dead trees, and holes seen were 5–15 m above the ground. About 20 such holes were noted, and one is shown in Figure 6. The holes faced in all directions, and varied greatly in shape from almost circular to very oval or droplet-like. One nesting cavity examined closely (by R. S. Crossin) was $5\frac{1}{3}$ m up in a small, nearly dead *Nothofagus* tree about 32 cm in diameter at nest height. The hole was approximately 12×9 cm in dimensions. The cavity was about 40 cm deep and lined at the bottom with a small amount of sawdust and wood chips. Construction of the cavity was not observed. The cavity was occupied by a lone nestling about three days old. The fact that this nest contained only one young bird is interesting, since the only laying adult female that we collected had laid but one egg and contained no other large ova. Johnson (1967) noted a family of three young birds and a clutch of four eggs of Magellanic Woodpeckers in Chile.



FIG. 5. Edge of mature *Nothofagus* forest northeast of Lake Lolog, 18 kilometers north of San Martín de los Andes, Neuquén. Magellanic Woodpeckers were abundant in this forest (see text). Note the dead tops of many trees on the slopes. Cattle were pastured in the foreground (where scattered bamboo clumps are seen), but not in the forest itself.

TAPPING AND DRUMMING

Sounds produced by the Magellanic Woodpecker's bill against wood are of two general types, tapping associated with feeding, and that serving a signal function. The latter may be the functional equivalent of "drumming" in other woodpeckers (e.g., species of *Dendrocopos*, *Dryocopus*, *Colaptes*, etc.), and is hence designated the "drum-tap."

Tapping associated with feeding is variable in intensity, frequency and duration, depending upon the foraging site and the food being sought. There is no single means of feeding (see above). The sounds produced by a foraging Magellanic Woodpecker range from barely audible scraping noises (like those of a nuthatch, *Sitta*) to loud, repetitive taps. In the former case feeding is by probing; in the latter case, it is by the delivering of hard blows with the bill. I was unable to detect a difference in tapping between foraging individuals of *Dendrocopos lignarius* and those of Magellanic Woodpeckers feeding in smaller branches of trees. In those instances when large (about 10 cm in diameter) pieces of bark were chopped out of a *Nothofagus* tree



FIG. 6. The interior of the mature *Nothofagus* forest shown in Figure 5. Amid the large trees with draped mosses and a bamboo understory is the nest cavity (in pale-barked tree above bamboo, left center) of a pair of Magellanic Woodpeckers.

the birds tapped loudly, and deliberately, usually at one to four blows in a series. The sounds of these blows are easily distinguished from drum-taps by their irregular pattern, lesser resonance, and (usually) lesser intensity.

Drum-taps were heard most frequently from one pair near a nest. These loud, hollow-sounding taps were produced by double or (occasionally) single blows against a tree. They may have been directed at me as an intruder near the nest. The drum-tap may serve in the establishment and maintenance of territories, and perhaps also as a location note for members of a pair. The drum-taps of the Magellanic Woodpecker are like those of *Phloeocastes robustus* (Fig. 9), which I heard in northeastern Argentina. Other species of *Phloeocastes* (*P. melanoleucos*, personal observation; *P. guatemalensis*, Slud, 1964; *P. leucopogon*, Wetmore, 1926), and *Campephilus* (*C. principalis*, Tanner, 1942; probably *C. imperialis*, see Nelson, 1898:221) have very similar drum-taps; indeed, these may characterize all campephiline species.

VOCALIZATIONS

Despite the brief time spent observing Magellanic Woodpeckers, several vocalizations were heard and recorded on tape. Other vocalizations prob-

ably remain to be described, and further study of those which are discussed below is necessary to ascertain their functions.

The vocalization uttered most often by the Magellanic Woodpeckers we observed is a variable, double-noted, harsh call, similar to that of *Phloeocoastes rubricollis* described by Snyder (1966:161) as an "explosive, nasal 'ngkah-ngkah.'" From two to five of these double-noted calls were given in each sequence. I noted variants of this call as follows: *pi-caá*; *wieeer*; *kee-aáh* (softer, less harsh); *kee-árg* (harsher, more drawn out); and *kee-yew* (second note less emphatic). The call was emitted by lone individuals, apparently directed at me or elicited by my presence. It was employed also by males and females comprising groups of three or four birds observed 20–23 November at 18 km north of San Martín de los Andes. Here it appeared to be an agonistic vocalization utilized in encounters, but it may also function as an alarm call. The significance of the variation in this call is unknown, although it presumably is related to the various levels of motivation of birds uttering the call.

Another call heard only from the pair of birds studied extensively can be designated the *toot* call. This is somewhat similar to the *kent* call of *Campephilus principalis* (Tanner, 1942), but it lacks the nasal quality of the latter (interestingly, the entire known vocal repertoire of *C. principalis* is comprised of nasal, trumpet-like notes). Single *toot* notes were heard occasionally from members of the pair as they were feeding. These might function as location notes, but they were also emitted in series of two or three notes, often leading into a burst of *pi-caá* calls, by the adult birds near their nest. In one sequence of calls near the nest the male emitted a series of four *toot* calls, followed by five or six *pi-caá* calls, and these in turn were followed by a drum-tap (see above). These notes may have been directed at me.

I heard these woodpeckers utter only two other types of vocalizations. One of these is a low *peep* call heard only near a nest occupied by a single nestling. While I was not certain that the young bird produced this note, it seems likely. The *peep* calls were interspersed with *pi-caá* calls emitted by one or both adults. This situation may have been the result of my presence; the calling young bird may have been hungry, and the disturbed adults may not have been feeding it a sufficient amount of food. Another call, heard only once, was a loud, prolonged *cray-cra-cra-cra-cra-cra*, given by a lone male clinging to a tree about 70 m from me. The bird flew off shortly after it called. Prolonged calls of this nature function in other woodpeckers (e.g., species of *Dendrocopos* and *Colaptes*; personal observation) in the establishment and defense of territory, but the lone instance of this call in the Magellanic Woodpecker provides no basis for speculation regarding its function.

DATA FROM SPECIMENS

Various data were obtained from 16 specimens that we collected, including one unfeathered nestling and 15 adults. Many of these were prepared as alcoholic specimens and skeletons for anatomical investigations.

The adults examined generally had irides colored pale yellow near the pupil, progressively becoming gold, and finally orange, away from the pupil. One bird had irides uniformly yellow, but with flecks of orange scattered throughout.

Most of the adult specimens, collected from 20–29 November, had not yet commenced breeding. One female (collected on 20 November) had laid an egg; its ovary measured 20×10 mm, and a brood patch was present. Six other females had ovary measurements of from 8×5 mm to 15×11 mm. One of the latter had slightly enlarged ova (to 2 mm) and an incipient brood patch, another had a defeathering brood patch, and a third female showed slight enlargement of the oviduct. The single nestling was obtained on 29 November.

Weights of seven adult males ranged from 312 to 363 g, with an average of 338.4 g. Six females weighed from 276 to 312 g, averaging 291.3 g. A female laying eggs weighed 326 g.

A brood patch was evident in only three of seven males that were collected, including the mate of the female that had laid an egg. These brood patches were not completely formed. The testes of six of these males measured from 4×2 mm to 10×8 mm.

The sole nestling was prepared as an alcoholic specimen, and few data are available for it. The essentially featherless, two or three day old bird was alone in a nest cavity (described above); its weight was 29.6 g.

A COMPARISON OF THE EXTERNAL MORPHOLOGY OF THE
MAGELLANIC WOODPECKER WITH OTHER CAMPEPHILINE WOODPECKERS

The Magellanic Woodpecker is a large picid exceeded in size among the woodpeckers only by several species of the genera *Campephilus*, *Dryocopus*, and *Mullcripicus*. Like the other campephiline woodpeckers this species has a (moderately) broad bill, and the inner two pairs of its rectrices are especially hard and stiff. Among the campephiline woodpeckers the Magellanic Woodpecker is usually considered a close relative of the North American ivory-billed woodpeckers (*Campephilus principalis* and *C. imperialis*, which probably comprise a superspecies; see Fig. 7). It approaches them in size, and in its white wing patches, which are visible when the bird is perched; the curled crest of the female is also like that of the female of *C. imperialis*. However, there are numerous differences between the Magellanic Woodpecker and the northern ivory-bills.



FIG. 7. From left to right are adult pairs of Magellanic Woodpecker (*Campephilus magellanicus*), Imperial Woodpecker (*C. imperialis*) and Ivory-billed Woodpecker (*C. principalis*). The male of each species is at the left, and the female at the right.

The Magellanic Woodpecker has a large white wing patch restricted to the inner web of the secondaries and the basal portion of the inner vane of the primaries; the primaries are never tipped with white. In contrast, the northern ivory-bills have white over the entire distal portion of all secondaries, and white progressively restricted from the inner to the outer primaries toward their tips and not their bases. This renders the flight pattern of these birds entirely different. Like *Phloeocoastes guatemalensis* and *P. melanoleucos* (see Figs. 8, 9) and the Pileated Woodpecker (*Dryocopus pileatus*), the Magellanic Woodpecker exhibits a *single*, anterior, white underwing patch, because the white in its flight feathers is continuous with that of the underwing coverts. The northern ivory-bills exhibit *two* white wing patches, an anterior patch formed by the white coverts, and a posterior white patch separated from it by the black bases of the flight feathers (see Tanner, 1942:2).

The Magellanic Woodpecker has relatively narrow, tapered outer (tenth) primaries, but the northern ivory-bills have even narrower, strongly falcate outer primaries. The rectrices of the Magellanic Woodpecker are less sturdy than are those of its northern relatives, and the second rectrices often exhibit so much wear that the central rectrices stand apart from them; these two



FIG. 8. From left to right are a male *Campephilus* (*Phloeoceastes*—see text) *guatemalensis*, a female of that species, a female Magellanic Woodpecker, and a male and female of *Campephilus leucopogon*.

pairs of rectrices are equal in the northern ivory-bills. The bill of the Magellanic Woodpecker is black, never ivory in color like the bills of *C. imperialis* and *C. principalis*, which are also relatively sturdier, more massive and broader (more wedge-shaped from a dorsal view) than that of *C. magellanicus*. Indeed, the bill of the Magellanic Woodpecker is proportionally less massive than that of several species of *Phloeoceastes* (especially *P. leucopogon*, Fig. 8). This is particularly reflected in the weak ridge on the gonyx of *Campephilus magellanicus*, as compared with *C. imperialis*, *C. principalis*, *Phloeoceastes leucopogon*, *P. melanoleucos*, and *P. robustus*. The bill size difference between the sexes of *C. magellanicus* was discussed above; this difference is greater than that occurring between the sexes of *C. principalis* and *C. imperialis*.

The male Magellanic Woodpecker has an all-red head and a rather short crest, matched among campephiline woodpeckers by *Phloeoceastes guatemalensis*. The female typically has a long, curled crest resembling that of the female of *C. imperialis*. Some species of *Phloeoceastes* such as *P. leucopogon*, *P. melanoleucos* and *P. guatemalensis*, have males with essentially all-red



FIG. 9. From left to right are a female and a male of *Campephilus melanoleucus*, a female Magellanic Woodpecker, and a male and female of *Campephilus robustus*.

heads, including the crest, and females with a crest that is black anteriorly and red posteriorly. The black crest feathers of these females are usually more elongate than the red feathers (sometimes red feathers are longer, but, if so, they have black tips). These black crest feathers occasionally curl somewhat forward (specimens of *P. leucopogon* and *P. melanoleucos*). I suggest that differential wear of black and red feathers may have been a factor in the evolution of the crests of these species, for melanin-containing feathers appear to be more durable and resistant to wear than are red feathers. The evolution of the three large species of *Campephilus* has been marked by reduction or elimination of red in the female's crest and head pattern. In the northern ivory-bills the females have entirely lost their red coloration of the head, and their long crests are black. The males of these two species have a reduced amount of red in the crest; essentially they have assumed the *female* head pattern of *Phloeoceastes melanoleucos* and *P. guatemalensis*. However, males of the northern ivory-bills have the red feathers of the crest longer than the black ones. The head pattern of the Magellanic Woodpecker has developed differently. The female of this species has a reduced amount of red, which occurs around the bill (the only other campephiline species the

females of which have red in this region is *Phloeoceastes guatemalensis*), and a curled black crest. However, reduction of red coloration has not occurred in the male. Instead, the latter has an all-red head like that of *Phloeoceastes guatemalensis* and *P. leucopogon* (the latter has a longer crest, however).

The Magellanic Woodpecker resembles *Phloeoceastes rubricollis* and differs from all other campephiline species in the absence of white on its back and neck. Ventrally, most specimens show some evidence of white at the tips of the abdominal feathers. A few individuals have most abdominal feathers with white tips. This condition gives a somewhat barred appearance to the abdomen, perhaps reflecting such a pattern in the ancestors of *C. magellanicus*. No other campephiline species with black underparts (*C. imperialis*, *C. principalis*, *Phloeoceastes leucopogon*) exhibits this white barring.

COMMENTS ON RELATIONSHIPS OF CAMPEPHILINE WOODPECKERS

The Magellanic Woodpecker has been considered to comprise a monotypic genus (*Ipocrantor* Cabanis and Heine), or to be congeneric (in *Campephilus* Gray) with the northern Imperial and Ivory-billed Woodpeckers. I believe that the Magellanic Woodpecker is not related directly to the northern ivory-bills, but rather is related to them indirectly by virtue of the independent evolution of both groups from species of *Phloeoceastes* Cabanis. The similarities between the Magellanic Woodpecker and the northern ivory-bills (e.g., tendency toward a falcate outer primary, longer gonys, plumage patterns; see above) seem to be the result of parallel evolution of large woodpeckers from the same basic ancestral stock of *Phloeoceastes*. Other similarities among the three large "ivory-bills" (e.g., vocalizations, color pattern, tail structure; see above) are shared with various species of *Phloeoceastes*. On the other hand the differences (see above) between the Magellanic Woodpecker and the northern ivory-billed group appear to reflect their recent independent evolutionary history.

The "generic" characters setting *Campephilus* and *Ipocrantor* apart from *Phloeoceastes* (chiefly their more falcate primaries and longer gonys, *Ipocrantor* being intermediate in the latter respect between *Campephilus* and *Phloeoceastes*; see Ridgway, 1914:9-10) are trivial and possibly correlated with the larger size of these birds. In any event, species groups within *Phloeoceastes* (these groups are: the *P. leucopogon-guatemalensis-melanoleucos-guayaquilensis* group; the *P. robustus* group, probably including *P. rubricollis*; and the *P. haematogaster-pollens* group) seem at least equally as distinct as *Campephilus* and *Ipocrantor*. The recognition of the latter two genera seems to necessitate the splitting apart from *Phloeoceastes* of at least two genera ("*Cniparchus*," "*Scapanens*"; for their characters see Ridgway, 1914) for taxonomic consistency.

The various groups of campephiline species, including the Magellanic Woodpecker group and the northern ivory-bill group, can be accommodated within a single genus (*Campephilus*) comprised of 11 species. These species are so fundamentally similar in coloration, structure and habits that their inclusion in one genus far better expresses their relationships than does splitting them into two genera (*Campephilus* and *Phloeoceastes*; this would be incorrect, as the species of *Campephilus* are not strictly monophyletic), three genera (*Campephilus*, *Ipocrantor*, and *Phloeoceastes*), five genera (the three last mentioned, *Cniparchus* and *Scapanus*) or even more genera (e.g., including *Megapicos* Malherbe). Hence, I follow Bock (1963) in considering the campephiline woodpeckers to comprise the single genus *Campephilus*.

SUMMARY

The large Magellanic Woodpecker (*Campephilus magellanicus*) inhabits the *Nothofagus* forests of southern South America, where only one small species of woodpecker (*Dendrocopos lignarius*) is a sympatric potential competitor. In the virtual absence of competition the Magellanic Woodpecker forages in diverse ways and at various sites. The sexes differ in bill length (almost no overlap between sexes), probably correlated with a difference in feeding habits. Nesting sites vary, as may the size of the clutch. The breeding season in southwestern Argentina commences in November. Drum-tapping is generally like that of other campephiline species for which data are available. Vocalizations resemble those of the Ivory-billed Woodpecker (*Campephilus principalis*) and other campephiline species (e.g., *Phloeoceastes rubricollis*). The Magellanic Woodpecker shows certain morphological similarities with the northern ivory-billed species (*Campephilus principalis* and *C. imperialis*), but also many differences which suggest that these two groups of woodpeckers independently evolved from ancestral species of *Phloeoceastes*. It is suggested that the Magellanic Woodpecker and the northern ivory-bills comprise but two of five groups of campephiline woodpeckers, no group of which is sufficiently distinct to merit separate generic recognition. Accordingly, the 11 species of campephiline woodpeckers are considered congeneric (genus *Campephilus*).

ACKNOWLEDGMENTS

I thank Richard S. Crossin and Francisco Espinola for assistance rendered in the field, and authorities of the National Science Foundation for support of my field studies in Argentina (N.S.F. grant G.B.-5891). Martin Morton and Roxie C. Laybourne kindly provided data from specimens at the Moore Laboratory of Zoology of Occidental College, and the United States National Museum, respectively. Mrs. Ilse Atkinson was helpful in facilitating our field work around San Martín de los Andes, Argentina.

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THE AMERICAN MUSEUM OF NATURAL HISTORY, NEW YORK, NEW YORK 10024,
27 MAY 1968.